

BA Subj

77. (New) The apparatus of claim 1, wherein the at least one antenna comprises a saddle coil.

78. (New) The method of claim 38, wherein the at least one antenna comprises a saddle coil.

REMARKS

In a first Office Action dated March 26, 2002, claims 1-74 were rejected under 35 U.S.C. § 103(a) as obvious over *Clark et al.* (U.S. 6,297,639). Applicants had previously cancelled claims 1-10, 30-47 and 67-74 without prejudice in the response filed on June 26, 2002.

In the current Office Action (dated September 3, 2002), claims 11-29, 48-66, 75-76 are rejected under 35 U.S.C. § 103(a) as obvious over *Hubans* (U.S. 5,233,304) in view of *Segesman* (U.S. 4,360,777). Applicants have amended the claims to clarify the invention.

The disclosure is objected to for failure to disclose where the tubular is mounted or disposed within the borehole. Applicants submit that it is common knowledge to those skilled in the art how the tubulars of the invention are disposed within a borehole. As known by those skilled in the art, a hole called a "borehole" is first drilled into the earth formation using a conventional drilling tool and the tubular is then simply placed into the hole. Depending on the formation conditions, the tubular may simply be left in the borehole as is, or, if desired, a cement mixture may be poured in the annulus between the tubular and the borehole to seal the tubular within the borehole. It is well known that the tubulars may be disposed within the borehole in various orientations such as in a deviated or horizontal orientation as shown in Figure 14 of the application. Any known or later developed technique for disposing a tubular within a borehole may be used as it is immaterial to the invention. A plethora of figures depicting the manner in which tubulars are disposed in a borehole may be found in the prior art.

Applicants respectfully submit that *Clark et al.* does not qualify as prior art against the present application. Applicants submit that *Clark et al.* does not fall within the universe of prior art allowable against the claimed invention under 35 U.S.C. § 102, thus not qualifying as prior art under 35 U.S.C. § 103. In the event *Clark et al.* is found to be qualified prior art, it is excluded as a 35 U.S.C. § 103(a) prior art reference under 35 U.S.C. § 103(c). *Segesman* is also excluded as a section 103 reference against the present application, pursuant to 35 U.S.C. § 103(c).

Per 35 U.S.C. § 103(c), subject matter which qualifies as prior art under one or more of subsections (e), (f), and (g) of section 35 U.S.C. § 102 shall not preclude patentability under 35

U.S.C. § 103 where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. Applicants state that:

The present application (S.N. 09/689,574), *Clark et al.* (U.S. 6,297,639), and *Segesman* (U.S. 4,360,777) were, at the time the invention of the present application was made, owned by Schlumberger Technology Corporation.

Therefore *Clark et al.* and *Segesman* are excluded as section 103 references against the present application.

Hubans does not teach or suggest the claimed invention to render it obvious under 35 U.S.C. § 103(a). The present invention is directed at permanent subsurface monitoring involving antennas that provide directed sensitivity or transmission of electromagnetic energy within the reservoir. In some embodiments the antenna's sensing or transmitting direction may be electronically steered (See amended claims 1, 11, 38 and 48). *Hubans* describes casing equipped with source coils adapted for activation by cables or a movable conductor shoe. The source coils proposed by *Hubans* have coaxial axes with respect to the casing axis and as such transmit in a general 360-degree distribution. Expressly missing from *Hubans* is any appreciation for, or discussion of, targeted reservoir monitoring with antennas that provide a selective or steerable envelope of sensitivity or transmission within the reservoir. Thus the rejections of pending claims 11-20 and 48-57 should be withdrawn.

Applicants request that original claims 1-10 and 38-47 be reinstated with the respective amendments and allowed for passage to issuance along with claims 11-20, 48-57, and new claims 77-78. Applicants also request an initialed copy of the enclosed Form PTO-1449 submitted herewith along with additional copies of the references cited in the Supplemental Information Disclosure Statement filed on June 24, 2002 for the present application. A complete list of proposed claims 1-42 is provided in Appendix B. The Examiner is invited to contact the undersigned attorney at (281) 285-4562 with any questions, comments or suggestions relating to the referenced patent application.

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Respectfully submitted,



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APPENDIX A: MARKED-UP VERSION TO SHOW CHANGES MADE

The material that has been added is underlined.

In the Claims:

2. An apparatus for monitoring a characteristic of a reservoir, comprising:
a tubular having an elongated body with a longitudinal axis, the tubular being adapted for permanent disposal within a borehole traversing the reservoir;
at least one antenna disposed on the exterior of the tubular, each at least one antenna having an axis and being adapted for transmission and/or reception of electromagnetic energy;
the at least one antenna being disposed on the tubular such that its axis is tilted with respect to the axis of the tubular to provide directed sensitivity or transmission of electromagnetic energy within the reservoir; and
means to activate the at least one antenna to transmit and/or receive electromagnetic energy.
3. The apparatus of claim 1, wherein at least two antennas are disposed on the exterior of the tubular such that their axes are tilted with respect to the axis of the tubular to provide directed sensitivity or transmission of electromagnetic energy within the reservoir.
38. A method for monitoring a reservoir characteristic, the reservoir being traversed by a borehole, comprising:
disposing a tubular within the borehole, the tubular having an elongated body with a longitudinal axis, the tubular being adapted for permanent disposal within the borehole and having at least one antenna disposed on the exterior of the tubular, each at least one antenna having an axis and being adapted for transmission and/or reception of electromagnetic energy;
disposing the at least one antenna on the tubular such that its axis is tilted with respect to the axis of the tubular to provide directed sensitivity or transmission of electromagnetic energy within the reservoir; and
activating the at least one antenna to transmit and/or receive electromagnetic energy.
40. The method of claim 38, comprising disposing at least two antennas on the exterior of the tubular such that their axes are tilted with respect to the axis of the tubular to provide directed sensitivity or transmission of electromagnetic energy within the reservoir.